

Workstations

Energy Efficiency

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Presentation Objectives

- Differentiating workstations from standard PCs
- Acknowledge that workstations are a small but important part of overall PC market
- Propose alternate approaches to Energy Star limits



Differentiating Workstations

- Speed and performance
 - High performance processors
 - Fast bus speeds
 - Large memory
 - Extensive I/O and networking capability
- High performance graphics/multiple displays
- Expansion support for memory, storage, PCI cards
- Leading edge innovation and latest technology



Workstation Usage

- Computer Aided Engineering (CAE)
- Computer Aided Design (CAD)
- Video and image processing
- Computer animation and special effects
- Scientific calculations
- Workstations optimized for specific usage



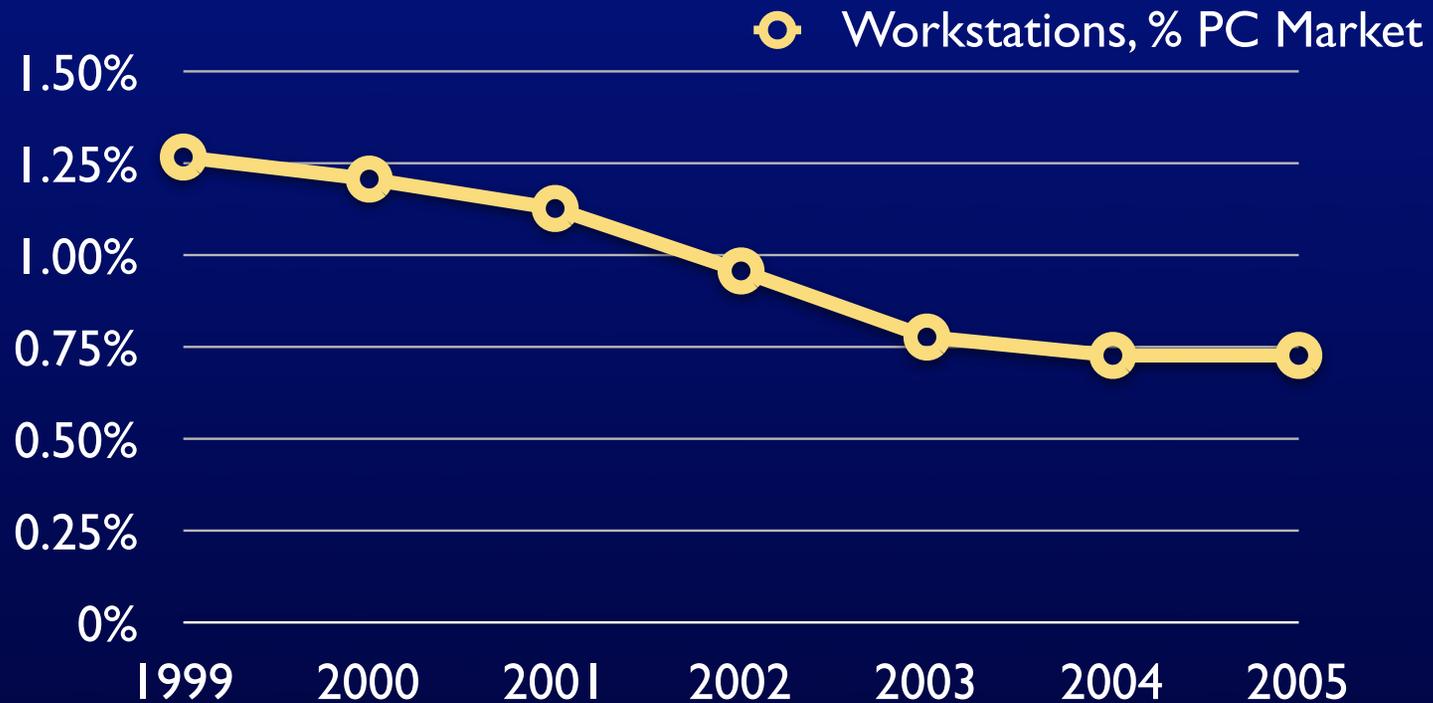
Workstation Implementation

- Professional users
- Mission critical applications
 - High performance
 - High reliability
- Highly networked
 - File sharing
 - Processor sharing (e.g. “grid computing”)
- Similar to servers - active 24/7



Small, But Important Market

- Workstations less than 1% of global PCs and steadily declining



Source: CEA

- Energy savings would be minimal



Alternate Efficiency Criteria

	TIER 1	TIER 2
Off	n/a	n/a
Sleep	n/a	n/a
Idle	not restricted	not restricted
Power Supply	70% at 20% load 75% at 50% load (Blue Angel)	80% at 20% load 80% at 50% load 80% at 100% load



Alternate Approach

Approach	Use Energy Star Version 3
Off	n/a
Sleep	10% of power supply output rating
Idle	not restricted
Power Supply	70% at 20% load 75% at 50% load (Blue Angel)



Summary

- Workstation customers demand performance & reliability
- Performance and expandability requires more power
- Leading edge technology is implemented on workstations first
- Workstations are a small but critical market - regulating off, sleep, and idle would offer minimal energy savings while hampering innovation and performance

